APPENDIX C-2
BIRD STRIKES AND BUILDING HEIGHT MEMO

Memorandum

To: John Davidson, Project Manager
Tasman East Specific Plan
City of Santa Clara

Cc: Nicholas Vanderboom, Related

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Subject: Bird strikes and building height in the Tasman East Specific Plan Area

This memorandum provides our expert opinion on whether specific building height restrictions are necessary in proximity to the Guadalupe River and the Ulistac Natural Reserve to reduce potential bird collisions. This memorandum is prepared by Jason Yakich, an ornithologist with 14 years of experience and specific knowledge related to bird-building collisions, and by Dr. Michael Josselyn, a wetland ecologist knowledgeable about local bird populations associated with wetlands and riparian areas.

The proposed project will have buildings that are up to 220 feet tall. WRA was asked to evaluate whether there is a scientific basis for reducing building height within 300 feet of the Guadalupe River and the Ulistac Natural Reserve, two areas that support both year-round resident and migratory birds, in order to mitigate potential impacts associated with bird collisions.

Available literature on bird-building collisions have analyzed the phenomenon related to a number of factors[i]. While bird collisions with residences (houses) is a more substantial problem in terms of number of bird deaths (Klem 1990[ii]), collisions with multifamily and commercial buildings, particularly glass-clad structures, is also thought to be a significant problem (Erickson et al. 2002[iii]). In an analysis that evaluated 23 studies, Loss et al (2014[iv]) reported that the distribution of bird collisions based on building type was 56% at low-rises (4-11 stories tall), 44% at residences (1-3 stories tall), and 1% at high-rises (> 12 stories tall).

Most often, bird collisions have been related to the extent of reflective and/or untreated glass on the building which provides the strongest opportunity for a collision, as well as the height and density of vegetation adjacent to the building that provides (or appears to provide) habitat for birds to occupy (Gelb and Delcretaz 2009[v], Klem 1990, Kahle et al. 2016[vi]). In addition, the majority of bird collisions occur at the lower portions of buildings, specifically ground level up to 60 feet in height (San Francisco Planning Department 2011 and references therein[vii]). In one of the few studies evaluating the effect of species richness and abundance in the surrounding area, Hager et al. (2008) found no relationship between collision frequency and local bird abundance suggesting that other physical factors (e.g. amount of glass, height of windows, etc.)

were more important factors.[viii] From a study of multiple buildings in Manhattan, New York City, Klem et al (2009)[ix] similarly concluded that the expanse of glass on a building facade is the factor most predictive of mortality rates. Night-time lighting has also become an important variable in assessing bird collisions with windows; Evans-Ogden (2002)[x] showed that light emission levels of sixteen buildings ranging in height from eight to 72 floors correlated directly with bird mortality, and that the amount of light emitted by a structure was a better predictor of mortality level than building height.

All of these studies were conducted on buildings in which bird safe features were not employed, but have led to the development of standards that are being applied in many local jurisdictions. These standards relate to the type/reflectivity of glass used, the size and orientation of windows, the use of design elements to visually "break up" exterior glass (from a bird's perspective), and landscaping restrictions to better ensure that birds are more aware of the presence of the window and do not attempt to fly into it. The City of San Francisco's bird safe building requirements have been developed to incorporate building materials and features that reduce bird collisions (San Francisco Planning Department 2011). None of these standards restrict building height but instead incorporate other measures that can reduce bird collision mortality.

To our knowledge, there is no scientific data indicating that building height in and of itself is a significant cause of bird mortality. Presumably, the proximity of existing single-family residences surrounded by vegetation is likely a more significant cause of bird mortality related to window collisions in the areas that are adjacent to the Ulistac Nature Preserve. It is our opinion that the adoption of bird safe design features for the proposed buildings within 300 feet of the Guadalupe River will be far more effective at reducing bird-building collisions than the restriction of building height.

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[i] Seewagen, ,C.L. and C. Sheppard. (eds). 2014. Bird Collisions with Windows: An Annotated Bibliography. American Bird Conservancy, Washington, DC 23 pages.

[ii] Klem, D. 1990. Collisions between birds and windows: Mortality and prevention. Jour. Field Ornithology 61(1): 120-128.

[iii] Erickson, W.P., G.D. Johnson, D.P.Young. 2005. A Summary and Comparison of Bird Mortality from Anthropogenic Causes with an Emphasis on Collisions. Third International Partners in Flight Conference. USDA Forest Service Gen Tech Report. 14pp.

[iv] Loss, S.R., T.Will, S.Loss, and P. Marra. 2014. Bird building collisions in the United States: Estimates of annual mortality and species vulnerability. The Condor: Ornithological Applications. 116:8-23.

[v] Gelb, Y. and N. Delcretaz. 2009. Windows and Vegetation: Primary Factors in Manhattan Bird Collisions. Northeastern Naturalist 16(3): 455-470.

[vi] Kahle, L.Q.,.M.E. Flannery, and J.P. Dumbacher. 2016. Bird-Window Collisions at a West-Coast Urban Park Museum: Analyses of Bird Biology and Window Attributes from Golden Gate Park, San Francisco. PLoS ONE 11(1): e0144600. doi:10.1371/journal.pone.0144600.

[vii] San Francisco Planning Department. 2011. Standards for Bird-Safe Buildings. July. 41 pp.

[viii] Hager, S.B., H. Trudell, K.J. McKay, S.M. Crandall, and L. Mayer. 2008. Bird density and mortality at windows. Wilson Journal of Ornithology 120(3):550-564.

[ix] Klem, D. Jr., C. J. Farmer, N. Delacretaz, Y. Gelb and P.G. Saenger, 2009. Architectural and Landscape Risk Factors Associated with Bird-Glass Collisions in an Urban Environment. Wilson Journal of Ornithology 121(1): 126-134.

[x] Evans-Ogden, 2002. Effect of Light Reduction on Collision of Migratory Birds.